ECONOMIC COMMENTARY

How Are Alberta's Largest Manufacturing Sectors Faring in the Current Recession?

August 29, 2016

Highlights:

Alberta's manufacturing sector is currently in recession as a result of the dramatic drop in crude oil prices. Lower oil prices have translated into much lower selling prices of refinery products and are causing oil and gas companies to drastically lower their capital spending which translates into reduced demand for machinery and equipment produced by Alberta's manufacturing and fabricated metals sectors.

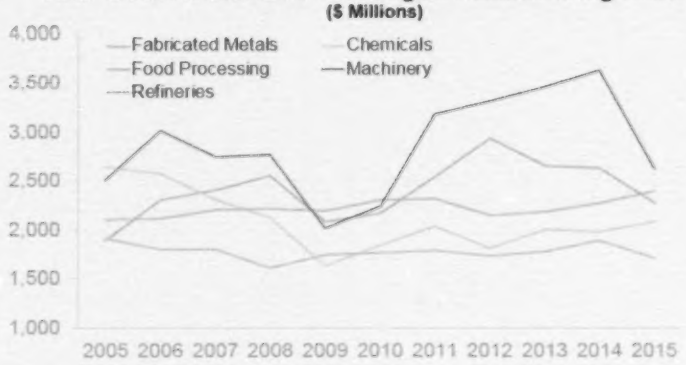
Alberta Government

The Alberta economy entered into recession in late 2014 or early 2015 because of sharply lower crude oil prices which caused the Alberta economy to shrink by 4.0% in 2015. The manufacturing industry was also impacted by weak oil prices and saw its output (GDP) fall by 6.9% in 2015, primarily because oil and gas companies reduced their capital spending programs. This especially affected producers of capital inputs such as machinery and fabricated metals. Lower oil prices have also resulted in sharply lower prices for refinery products that are produced in Alberta. In this commentary we will examine how Alberta's manufacturing sector has so far weathered the current recession.

GDP in the Manufacturing Industry Fell Sharply in 2015

Between 2005 and 2015 Alberta's manufacturing GDP declined by 2.7%[1] because of large decreases in the chemicals sector (GDP in that sector fell 21% between 2005 and 2015) and in petroleum refineries (down 11%). Among the sectors with at least $500 million in GDP the highest 10-year GDP growth was registered in the fabricated metals and plastics and rubber products sub-sectors (both were up 20%) and in food processing (up 14%).

GDP Trends in Alberta's Five Largest Manufacturing Sectors
($ Millions)



Source: Statistics Canada

In 2015, two-thirds of the $1.4 billion drop in Alberta's manufacturing industry's GDP can be traced back to its largest sector on a GDP basis: machinery manufacturing. The machinery sector's GDP fell 28% mainly as a result of a 41% decline in the agricultural, construction and mining machinery sub-sector (more than 80% of that sub-sector's output is destined for the oil and gas fields). The fabricated metals sector accounted for close to one-quarter of the manufacturing GDP drop in 2015 as that sector's output dropped 13%, in part because of a 40% decrease in the machine shops sub-sector. Other sectors with sizable GDP declines in 2015: transportation equipment (down 12%); primary metals such as steel products (down 11%); refineries (down 9%); plastics and rubber (down 6%); and wood products (down 5%). A number of manufacturing sectors still expanded in 2015: pulp and paper (up 11%); food processing (up 5%); and chemicals (up 5%).

The Canadian GDP by industry table with monthly GDP estimates suggests that the machinery and fabricated metals sectors are also seeing large output declines in 2016 because of continued weakness in capital investment by the oil and gas sector. In the first five months of 2016 GDP in Canada's fabricated metals sector fell 6% from the same period of 2015, led by large declines in the boilers and tanks and machine shops sub-sectors, both of which are major suppliers to the oil and gas sector. Over

[1] All 10-year per cent changes in this commentary represent cumulative changes (from 2005 and 2015); they are not average annual changes. Therefore, a cumulative change of 2.7% between 2005 and 2015 translates into an average decline of about 0.3% per year.

the same period Canadian GDP in the machinery sector dropped by 13%, led by a 32% decrease in the construction and mining machinery sub-sector.

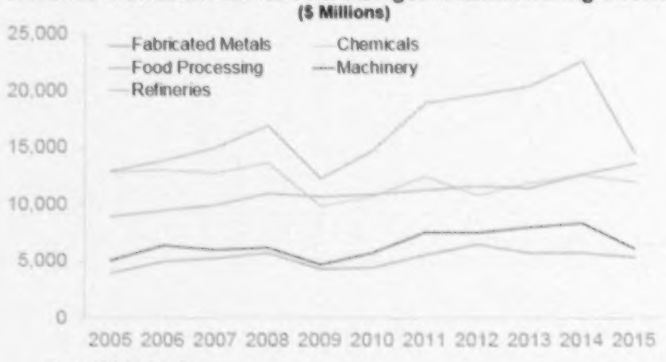
Manufacturing Revenues are Sharply Lower Because of the Machinery and Refineries Sectors

Between 2005 and 2014 Alberta's manufacturing revenues grew by 31% to $78.9 billion. However, in 2015 revenues fell 13.7% to $68.1 billion and as a result the 10-year growth rate (between 2005 and 2015) dropped to only 12.7%. The 10-year increase of 12.7% in revenues was the result of higher prices as volumes actually declined during that period[2]. Among the 10 largest sectors (with at least $1 billion in revenues) the highest 10-year growth on a revenue basis was registered in food processing (up 53%), followed by non-metallic mineral products such as cement (up 39%), fabricated metals (up 34%), plastics and rubber products (up 30%), and machinery (up 21%).

The steep revenue decline in 2015 was the result of declines in both volumes and prices. According to the above GDP section manufacturing volumes dropped 6.9% in 2015. Much lower crude oil prices led to sharply lower prices for refinery products such as gasoline and diesel. On a revenue basis the refined petroleum (refineries) sector is Alberta's largest manufacturing sector with $14.6 billion in revenues in 2015 and about three-quarters of the $10.9 billion drop in overall manufacturing revenues can in fact be traced back to a 36% decline in refineries' revenues. Output in this sector fell about 9% and prices an estimated 29%. The machinery sector, the fourth largest manufacturing sector, accounted for about 20% of the overall manufacturing decline in 2015 as its revenues declined by 27% to $6.2 billion. Machinery's large drop was mainly the result of a 42% decline in its mining and oil and gas field machinery sub-sector, which accounts for about one-half of machinery revenues.

Why do the rankings differ when using revenues rather than GDP? The problem with using revenues as the main yardstick for ranking sectors is that in some sectors, such as petroleum refining, very little processing takes places and most of the value of the output can be traced back to the value of the inputs (e.g. crude oil in the case of refineries). The petroleum refining sector employs relatively few workers and this translates into a much lower contribution to GDP than in the machinery sector.

Revenue Trends in Alberta's Five Largest Manufacturing Sectors
($ Millions)



Source: Statistics Canada

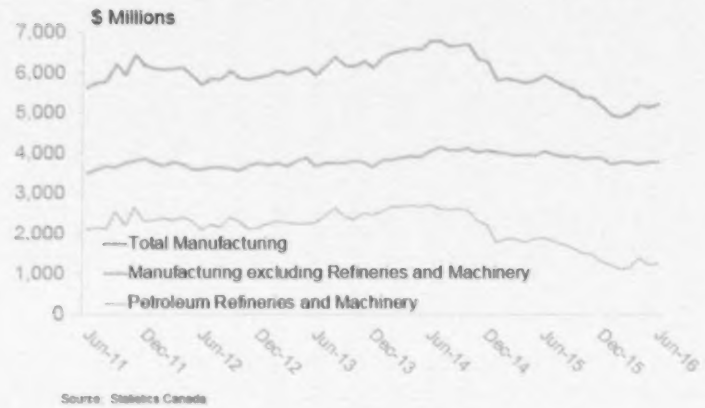
The food processing sector is Alberta's second largest manufacturing sector. Among the 10 largest manufacturing sectors, food processing registered the largest 10-year gain with revenues growing by 53% between 2005 and 2015 to $13.6

[2] See GDP Trends section

billion. The two largest sub-sectors, meat products and grains and oilseed milling, grew strongly by 55% and 83%, respectively.

The chemicals sector, Alberta's number three manufacturing sector, saw its revenues fall by 6.5% between 2005 and 2015 to $12 billion. In the largest sub-sector, basic chemicals (mainly petrochemicals), revenues fell 30% to $4.8 billion, while revenues in the second largest sector, synthetic resins and fibres (such as polyethylene), rose 43% to $4.7 billion.

Refinery Products and Machinery driving down Manufacturing Sales



Source: Statistics Canada

Manufacturing revenues have continued to fall in 2016: they fell 13% during the first six months of 2016 from the same period of 2015. Although most manufacturing sectors are registering declines in 2016, the largest decreases were again registered in the petroleum refineries and machinery sectors. When excluding revenues in the refineries and machinery sectors manufacturing sales were about 4% lower in the first six months of 2016 compared with the first six months of 2015 as the non-metallic minerals[3], primary metals[4] and fabricated metals sectors[5] also were impacted by reduced capital spending by the oil and gas industry.

This year the largest contributor to the decline in manufacturing revenues is the machinery sector, accounting for 40% of the manufacturing decline due to a very sharp 51% contraction in machinery sales so far in 2016. Sales of mining and oil and gas field machinery fell 68% and of pumps and compressors 56%. Petroleum refineries accounted for almost 40% of the overall drop in manufacturing sales as their sales have fallen by 24% so far this year. Because of these setbacks the petroleum refining sector will likely become the third largest manufacturing sector in 2016, compared with its number one spot in 2015, while the machinery sector may drop from fourth to sixth largest sector. If current trends continue sales of mining and oil and gas field

According to Statistics Canada at least 70 Alberta manufacturing companies were impacted by the Fort McMurray wildfire in May and 41 continued to feel its effects in June. Most of the affected companies are in the machinery and fabricated metals sectors as they supply machinery and equipment to the oil sands sector. Because of the wildfire, sales in these two sectors were lower in May and June than they would have been. Some manufacturers in the wood products sector reported increases in their sales in anticipation of rebuilding.

[3] Such as cement and concrete products
[4] Such as pipe for oil and gas pipelines and casings for oil and gas drilling
[5] Especially machine shop revenues were sharply lower in both 2015 and 2016

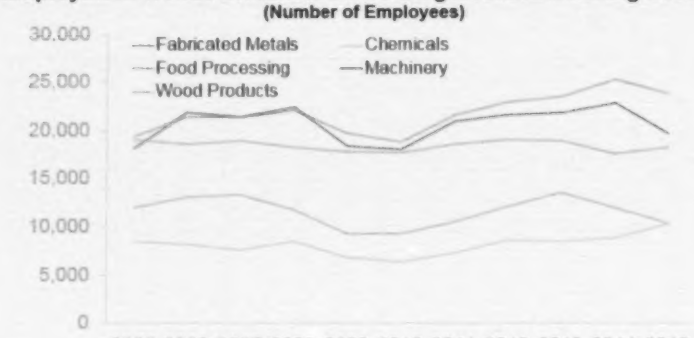
machinery may only reach about $1 billion for all of 2016, compared with revenues of $4.7 billion in 2014.

Payroll Employment Continues to Decline this Year

According to the Survey of Employment, Payrolls and Hours[6], payroll employment in the manufacturing industry rose 2% between 2005 and 2015 to 130,754. The largest sector on an employment basis is fabricated metals with 23,872 employees in 2015 followed by machinery (19,673), food processing (18,211), wood products (10,365) and chemicals (10,243). For the employment measure petroleum refineries only rank seventh with 6,018 employees.

Because of the current recession manufacturing employment fell by 4.2% or by 5,674 employees in 2015. The largest losses were registered in the machinery sector which lost 3,121 jobs in 2015, primarily due to a drop of 2,117 in the agricultural, construction and mining machinery sub-sector. Other sectors with large employment losses in 2015 were fabricated metals (a loss of 1,471 jobs) and wood products (down 1,648) while employment rose in the chemicals sector (up 1,393) and in food processing (up 611).

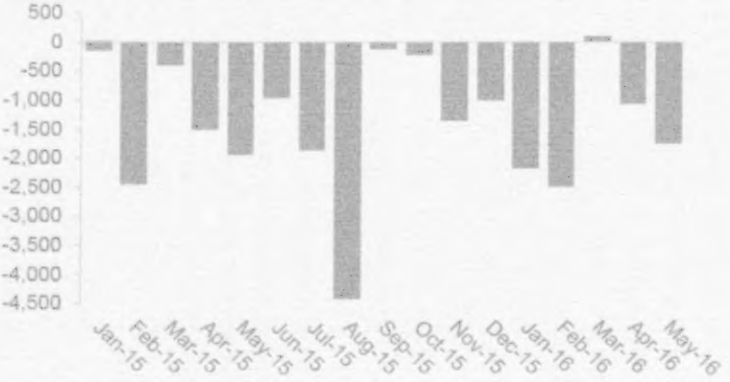
Employment Trends in Alberta's Five Largest Manufacturing Sectors
(Number of Employees)



Source: Statistics Canada

The manufacturing sector has continued to lose jobs in 2016: between December 2015 and May 2016 manufacturing employment dropped by more than 7,000 from 124,169 in December 2015 to 116,773 in May. Since December 2014 this sector has lost about 24,000 jobs. Not surprisingly, machinery was the sector with the largest year-to-date job losses: payroll employment declined by about 3,300 or 19% between December 2015 and May 2016. Most of these job losses can be attributed to the mining and oil and gas field

Monthly Employment Losses in Alberta's Manufacturing Sector



Source: Statistics Canada

[6] For the employment measure the monthly establishment based Survey of Employment, Payrolls and Hours (SEPH) is a reliable source of employment by industry estimates because it is a business census of non-farm payroll employees. Since it is a company based survey it excludes self-employment, but this is not a major problem for the manufacturing industry as self-employment accounts for less than 3% of total employment.

machinery and the pumps and compressors sub-sectors.

Other sectors with large losses in 2016 include:

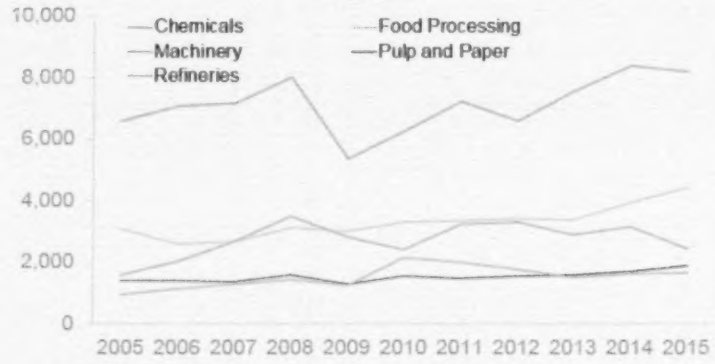
- Fabricated metals with a loss of 1,500 jobs so far this year, especially in machine shops and architectural and structural metals;
- Wood products – down by about 1,000 jobs;
- Food processing – a loss of 800 jobs;
- Plastics and rubber – an employment loss of 550; and
- Primary metals – a loss of 480 jobs.

Exports of Manufactured Goods are Sharply Lower in 2016

More than one-quarter of Alberta's manufacturing sales are destined for international markets. The export intensity ratios (export sales as a share of total sales) are in excess of 40% in these sectors: pulp and paper; chemicals; electronics; electrical equipment; and primary metals. The lowest export intensities were recorded for the non-metallic mineral products, refineries, fabricated metals, plastics and rubber, and furniture sectors, all of which export less than one-fifth of their sales.

Between 2005 and 2014 exports by Alberta's manufacturing industry rose 23% to $24.3 billion. Exports fell 1.5% in 2015 to $23.9 billion as exports of oil and gas field related machinery and fabricated metals dropped by more than 20%. The 10-year increase of 21% in export sales was mostly the result of higher prices as volumes increased by only about 2% during that period. Among the sectors with at least $1 billion in exports the highest 10-year growth on an export basis was registered in petroleum refineries (up 72%), followed by machinery (up 51%), processed foods (up 43%) and pulp and paper (up 36%).

Trends in the Largest Manufacturing Sectors on an Export Basis
($ Millions)



Source: Statistics Canada

The 1.5% export drop in 2015 was the result of lower prices as manufacturing export volumes rose by close to 3%. Much lower crude oil prices led to sharply lower export prices for refinery products, such as gasoline and diesel, but export volumes in this sector rose sharply by more than 40%.

On an export basis the chemicals sector is Alberta's largest manufacturing sector with $8.2 billion in exports in 2015, followed by processed foods, machinery, pulp and paper, and petroleum refineries. Exports of chemicals fell 2.3% in 2015 because of a more than 80% drop in exports of saturated acyclic hydrocarbons. The machinery sector saw its export value decline by 23% to a nine-year low of $2.4

billion[7], in part because of a 48% drop in its pumps and compressors machinery sub-sector, which accounts for about one-fifth of machinery export revenues.

Although exports of manufactured goods held up relatively well in 2015, the same is not the case in 2016: the value of manufacturing exports fell 13% between the first half of 2015 and the first half of 2016 to $10.6 billion. Most manufacturing sectors had lower export sales in 2016 than in 2015 and again the machinery and petroleum refineries sectors were the hardest hit with declines of 45% and 33%, respectively. These two sectors accounted for 57% of the overall manufacturing exports decline in 2016. For the machinery sector the largest declines were noted in the mining and oil and gas field machinery sub-sector (such as boring and sinking machinery) and in the material handling equipment sub-sector (such as winches and capstans and lifting and handling machinery). Exports of refinery products were sharply lower as prices of diesel, gasoline and other fuel oils have tumbled by about 30% this year. Exports of chemical products fell 6% in 2016 as an 8% increase in export volumes was more than offset by and 8% drop in prices. The fabricated metals sector has seen its exports drop by 28% so far in 2016 as a result of a 41% decline in the metal valve manufacturing sub-sector, which accounts for about one-quarter of fabricated metals' export sales.

Exports of biodiesel, which are part of the chemicals sector, have surged in recent years, rising from $4 million in 2012 to $71 million in 2015. Biodiesel exports have quadrupled so far this year, reached $74 million in the first half of 2016, up from $17 million in the first half of 2015.

Summary

Lower crude oil and natural gas prices have had a severe impact on Alberta's manufacturing sector. This impact is two-fold: 1) lower input prices have caused much lower selling prices of refinery products and of a number of chemicals; 2) oil and gas companies are drastically lowering their capital spending which translates into reduced demand for machinery and equipment produced by Alberta's manufacturing and fabricated metals sectors. As a result, GDP in the manufacturing sector fell by 6.9% in 2015 and employment and the value of shipments were also much lower that year. All current indicators suggest that the manufacturing sector is continuing to struggle this year as the value of shipments was sharply lower in the first half of this year as were exports and employment levels. The sectors that have been most impacted in 2015 and 2016 by the current recession are the machinery and refined petroleum sectors, although a number of other sectors such as fabricated and primary metals and non-metallic mineral products are also affected by lower capital spending.

Note: monthly statistics for the manufacturing industry and many other economic indicators can be found on the Alberta Economic Dashboard at http://economicdashboard.alberta.ca

[7] **The 10-year increase of 51% for machinery exports was the result of a doubling of exports during the first few years of that time period**